

## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	228	fiber stretcher AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 08:12
L3	98	well known AND fiber stretcher AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 08:15
L4	13	well known SAME fiber stretcher AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 08:40
L5	2172	probabilit\$2 AND phase error AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 08:38
L6	961	filter AND estimat\$3 AND length AND probabilit\$2 AND phase error AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 08:39
L7	843	detection AND filter AND estimat\$3 AND length AND probabilit\$2 AND phase error AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 08:46
L8	6	well known SAME fiber stretcher AND ("359".clas. OR "385".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 08:40
L9	10	detection AND filter AND estimat\$3 AND length AND probabilit\$2 AND phase error AND ("359".clas. OR "385".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:35

## EAST Search History

L10	2	"5157461".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:34
L11	2	"6160627".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:34
L12	0	least absolute residual AND (bi-square OR bisquare) weight AND ("359".clas. OR "385".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:36
L13	6	least absolute residual OR (bi-square OR bisquare) weight AND ("359".clas. OR "385".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 10:27
L14	85	absolute residual OR (bi-square OR bisquare) weight AND ("359".clas. OR "385".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:44
L15	15	estimation AND absolute residual OR (bi-square OR bisquare) weight AND ("359".clas. OR "385".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:55
L16	21	(estimation OR estimate) AND absolute residual OR (bi-square OR bisquare) weight AND ("359".clas. OR "385".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:45
L17	2	optic AND (estimation OR estimate) AND absolute residual OR (bi-square OR bisquare) weight AND ("359".clas. OR "385".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:45

## EAST Search History

L18	3	optic AND absolute residual OR (bi-square OR bisquare) weight AND ("359".clas. OR "385".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:45
L19	0	optic AND (absolute residual OR (bi-square OR bisquare)) AND ("359".clas. OR "385".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:46
L20	4	optic AND (absolute residual OR (bi-square OR bisquare)) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:46
L21	0	optic AND (absolute residual OR (bi-square OR bisquare)) weight AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:46
L22	3	optic AND absolute residual OR bi\$1square weight AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:46
L23	1	optic AND (absolute residual OR bi\$1square weight) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:47
L24	70	(absolute residual OR bi\$1square weight) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:47
L25	0	phase error AND (absolute residual OR bi\$1square weight) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:47

## EAST Search History

L26	4	estimat\$3 AND phase AND (absolute residual OR bi\$1square weight) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:48
L27	16	estimat\$3 AND (absolute residual OR bi\$1square weight) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:48
L31	3	robust least square AND (absolute residual OR (bisquare OR bi square OR bi-square)) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:50
L35	31	robust least square AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:51
L36	0	least absolute residual AND robust least square AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:51
L38	19	weight AND robust least square AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 09:52
L39	14	bisquare OR least absolute residuals AND ("359".clas. OR "385".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 10:29
S1	154	380/258.ccls. AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:39

## EAST Search History

S2	2	"5243649".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:21
S3	2	"5339182".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:22
S4	2	"5414771".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:23
S5	2	"5675648".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:24
S6	2	"5732139".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:25
S7	2	"5757912".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:26
S8	2	"5764765".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:27
S9	2	"5768378".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:29

## EAST Search History

S10	2	"5850441".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:30
S11	2	"5953421".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:30
S12	2	"5966224".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:31
S13	2	"6028935".pn.	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:32
S14	0	training symbols AND 380/258.ccls. AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:39
S15	3	training symbols AND "380".clas. AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 15:04
S16	3	timing symbols AND "380".clas. AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:46
S17	23	path length AND quantum AND ("380".clas. OR "726".clas. OR "713".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:54

## EAST Search History

S18	15	timing AND path length AND quantum AND ("380".clas. OR "726".clas. OR "713".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:54
S19	16	timing AND (path length OR length path) AND quantum AND ("380".clas. OR "726".clas. OR "713".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:59
S20	24	(path length OR length path) AND quantum AND ("380".clas. OR "726".clas. OR "713".clas.) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:54
S21	3	quantum cryptographic key distribution AND (path length OR length path) AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 14:59
S22	822	training symbols AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 15:04
S23	32	(length path OR path length) AND training symbols AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 15:05
S24	29	phase AND (length path OR path length) AND training symbols AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 15:10
S25	495	phase AND (length path OR path length) AND timing pulse AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 15:12

## EAST Search History

S26	42	quantum AND phase AND (length path OR path length) AND timing pulse AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 15:12
S27	2	quantum AND phase error AND (length path OR path length) AND timing pulse AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 16:17
S28	86	quantum AND phase error AND path AND timing AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 18:23
S29	1	(quantum key distribution OR quantum cryptographic key distribution OR "QKD") AND quantum AND phase error AND path AND timing AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/18 16:18
S30	2	phase error AND phase shift AND fiber stretcher AND (@pd<"20021015" or @ad<"20021015" or @prad<"20021015" or @rlad<"20021015")	US-PGPUB; USPAT; USOCR; EPO; DERWENT; IBM_TDB	ADJ	ON	2007/09/19 08:12





fiber optic phase shift path (timing OR synchro

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**Patents** Patents 1 - 1 on fiber optic phase shift path (timing OR synchronization) fiber stretcher. (0.66 se

**Fiber optic continuous true time-delay modulator** [Sort by relevance](#) | [Sort by date \(new first\)](#) | [Sort by date \(old first\)](#)

US Pat. 5526170 - Filed Aug 6, 1993 - The United States of America as represented by the Secretary of the Navy  
This method provides 30 a **phase shift** that is independent of frequency. ...  
time-delay modulator is the piezoelectric optical **fiber stretcher** (See, US Pat. ...

fiber optic phase shift path (timing OR synchr

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quantum cryptography distance phase timing

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## Patents

Patents 1 - 4 on quantum cryptography distance phase timing. (0.27 seconds)

### Quantum cryptography device and method

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US Pat. 6438234 - Filed Mar 5, 1999 - Swisscom AG

Bob lets pulse P2 unaltered but modulates the **phase** of the first pulse 30 PI with the ... «**Quantum Cryptography**», Scientific American 267, pp. 50-57, 1992. ...

### Key distribution in a multiple access network using quantum cryptography

US Pat. 5768378 - Filed Mar 7, 1996 - British Telecommunications public limited company

This will depend on the **distance** could be isolated by means of ... elements of the **timing** system for the **quantum** key 20 to 130o nm light and therefore ...

### Quantum cryptographic communication channel based on quantum coherence

US Pat. 6522749 - Filed Jan 21, 1999 - NEC Laboratories America, Inc.

The third method is often referred to as "**Quantum Cryptography**". ... a controller for controlling the **timing** of the **phase** change from the first **phase** setting ...

### Method and apparatus for clock synchronization using quantum mechanical non ...

US Pat. 7006635 - Filed Aug 30, 2001 - The United States of America as represented by the Secretary of the Navy

This process provides **timing** information, which is subsequently used, for decoding ... discloses a method of communication based on 15 **quantum cryptography**, ...

quantum cryptography distance phase timing

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quantum cryptography phase encoding path Q

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## Patents

Patents 1 - 2 on quantum cryptography phase encoding path QKD. (0.18 seconds)

[Positive-operator-valued-measure](#)

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[receiver for quantum cryptography](#)

US Pat. 5999285 - Filed May 23, 1997 - The United States of America as represented by the Secretary of the Army

Bennett also pro- example, quantum cryptography. posed a photonic interferometric version of QKD (Phys. This and other objects of the invention are achieved ...

[Autocompensating quantum cryptographic key distribution system based on ...](#)

US Pat. 6188768 - Filed Mar 31, 1998 - International Business Machines Corporation

QKD was first described by CH Bennett et al., "Quantum Cryptography: Public ...

Since these protocols encode information in the phase or polarization of the ...

quantum cryptography phase encoding path Q

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quantum cryptography (path length OR length

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## Patents

Patents 1 - 13 on **quantum cryptography (path length OR length path)**. (0.66 seconds)

[Key distribution in a multiple access](#) | [Sort by relevance](#) | [Sort by date \(new first\)](#) | [Sort by date \(old first\)](#)

### network using quantum cryptography

US Pat. 5768378 - Filed Mar 7, 1996 - British Telecommunications public limited company  
1 is the **path length** and PIS the net coupling ratio for the **path**. The **quantum**  
... "Experimental **Quantum Cryptography**", J. 35 Cryptology, 5, 3 (1992). ...

### Method and apparatus for polarization-insensitive quantum cryptography

US Pat. 6529601 - Filed Mar 5, 1998 - British Telecommunications public limited company  
12 uses an external **length** of PM 35 fibre to separate the output pulses into ...  
et al "Experimental **Quantum Cryptography**", J. **Cryptography**, 5, 3 (1992). ...

### Quantum cryptography device and method

US Pat. 6438234 - Filed Mar 5, 1999 - Swisscom AG  
In **quantum cryptography**, the key is exchanged through a **quantum** channel. ...  
as both interfering pulses follow the same **path** between Alice and Bob, ...

### Autocompensating quantum cryptographic key distribution system based on ...

US Pat. 6188768 - Filed Mar 31, 1998 - International Business Machines Corporation  
QKD was first described by CH Bennett et al., "**Quantum Cryptography**: Public...  
of the separate pulses travels the same total **path length** back to the point ...

### Quantum cryptography

US Pat. 5953421 - Filed Jan 30, 1997 - British Telecommunications public limited company  
4, an alternative mechanically switched **path** 56 is provided for the output from  
... during **length** may be provided by means of wavelength-selective filters. ...

### Method and device for producing a choice of either single photons or pairs ...

US Pat. 6430345 - Filed Sep 27, 2000 - Deutsche Telekom AG  
6, Di Giuseppe et al., "Entangled non-local **quantum** interfer- ometry," ...  
an interferometer with variable optical **path-length** difference 81p-81S, ...

### Optical layer multicasting using a single sub-carrier header and a multicast ...

US Pat. 6757497 - Filed Jan 30, 2001 - The Regents of the University of California  
Hence, multiple receiving users must all synchronize the **path length** of their  
lasers. ... "Experimental **Quantum Cryptography**", Journal of Cryptology, Vol. ...

### METHOD FOR CHANGING THE POLARIZATION OF AT LEAST ONE OF THE PHOTONS EMITTED ...

US Pat. 6884990 - Filed Feb 21, 2001 - Deutsche Telekom AG  
... for example, in the field of **quantum** computers and **quantum cryptography** to  
... from the pulse-repetition rate and from the optical **path length** from the ...

### Ultra-bright source of polarization-entangled photons

US Pat. 6424665 - Filed Apr 14, 2000 - The Regents of the University of California  
It is worth mentioning that this rate is roughly the minimum requirement for  
**quantum cryptography** in an earth-to- satellite configuration. ...

#### Optical layer multicasting

US Pat. 6873797 - Filed Jan 30, 2001 - The Regents of the University of California  
«32x32 Full-Mesh (1024 **Path**) Wavelength- Routing WDM Network Based on Uniform  
... et al" "Experimental **Quantum Cryptography**," Journal of Cryptology, vol. ...

#### Method for generating a random number on a **quantum**-mechanical basis and ...

US Pat. 6609139 - Filed May 9, 2000 - Deutsche Telekom AG  
Especially well known is the sole secure **cryptography** method in which the key  
... which has undergone careful **quantum**-mechanical investigation is the **path** ...

#### Storage device random bit generator

US Pat. 6317499 - Filed Aug 3, 1998 - Lucent Technologies Inc.  
In **cryptography**, 15 randomness is paramount for key randomness ... Other methods  
include the **quantum**- mechanical noise in transistors and lava lamp blobs. ...

#### **Quantum cryptography** system for a secure transmission of random keys using a ...

US Pat. 6748081 - Filed Jul 20, 1999 - Deutsche Telekom AG  
A feature of conventional **quantum cryptography** methods is the ability to switch  
a polarizer ... To do this, a defined optical **path** must be inserted into two ...

quantum cryptography (path length OR length)

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quantum cryptography distance phase

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## Patents

Patents 1 - 7 on **quantum cryptography distance phase**. (0.36 seconds)

### Quantum cryptography device and method

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US Pat. 6438234 - Filed Mar 5, 1999 - Swisscom AG

Bob lets pulse P2 unaltered but modulates the **phase** of the first pulse 30 PI with the ... «**Quantum Cryptography**», Scientific American 267, pp. 50-57, 1992. ...

### Quantum cryptographic communication channel based on quantum coherence

US Pat. 6522749 - Filed Jan 21, 1999 - NEC Laboratories America, Inc.

The third method is often referred to as "**Quantum Cryptography**". ... The prior art uses a **phase** modulation for communication which is required to be ...

### Key distribution in a multiple access network using quantum cryptography

US Pat. 5768378 - Filed Mar 7, 1996 - British Telecommunications public limited company

This will depend on the **distance** could be isolated by means of ... equalisation is not former case uses **phase**-encoding for the **quantum** channel, employed. ...

### Method and apparatus for quantum distribution of an encryption key

US Pat. 6272224 - Filed Apr 21, 1998 - France Telecom

It is also described in the article by CH BENNETT et al entitled "Experimental **Quantum Cryptography**" published in the "Journal of Cryptology" 5, pp 3-28, ...

### Ultra-bright source of polarization-entangled photons

US Pat. 6424665 - Filed Apr 14, 2000 - The Regents of the University of California

2B graphically illustrated the ability to 40 tune the relative **phase** between ... effect an eavesdropper would produce in a **quantum cryptography** application. ...

### Method and apparatus for clock synchronization using quantum mechanical non ...

US Pat. 7006635 - Filed Aug 30, 2001 - The United States of America as represented by the Secretary of the Navy

The transmitter in turn randomly selects a **quantum** mechanical operator and uses that ... between the times of two clocks separated by an arbitrary **distance**. ...

### Coherence filters and systems utilizing same

US Pat. 6226113 - Filed May 5, 1997 - The University of Rochester

7C shows a **cryptography** system where the 40 key is a complement of masks, ... E., 1995, Optical Coherence and **Quantum** Optics (Cambridge University Press, ...

quantum cryptography distance phase

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quantum cryptography path length

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## Patents

Patents 1 - 13 on **quantum cryptography path length**. (0.14 seconds)

[Key distribution in a multiple access network using quantum cryptography](#) [Sort by relevance](#) | [Sort by date \(new first\)](#) | [Sort by date \(old first\)](#)

### Key distribution in a multiple access network using quantum cryptography

US Pat. 5768378 - Filed Mar 7, 1996 - British Telecommunications public limited company  
1 is the **path length** and PIS the net coupling ratio for the **path**. The **quantum**  
... "Experimental **Quantum Cryptography**", J. 35 Cryptology, 5, 3 (1992). ...

### Method and apparatus for polarization-insensitive quantum cryptography

US Pat. 6529601 - Filed Mar 5, 1998 - British Telecommunications public limited company  
12 uses an external **length** of PM 35-fibre to separate the output pulses into ...  
et al "Experimental **Quantum Cryptography**", J. **Cryptography**, 5, 3 (1992). ...

### Quantum cryptography device and method

US Pat. 6438234 - Filed Mar 5, 1999 - Swisscom AG  
In **quantum cryptography**, the key is exchanged through a **quantum** channel. ...  
as both interfering pulses follow the same **path** between Alice and Bob, ...

### Autocompensating quantum cryptographic key distribution system based on ...

US Pat. 6188768 - Filed Mar 31, 1998 - International Business Machines Corporation  
QKD was first described by CH Bennett et al., "Quantum Cryptography: Public ...  
of the separate pulses travels the same total **path length** back to the point ...

### Quantum cryptography

US Pat. 5953421 - Filed Jan 30, 1997 - British Telecommunications public limited company  
4, an alternative mechanically switched **path** 56 is provided for the output from  
... during **length** may be provided by means of wavelength-selective filters. ...

### Method and device for producing a choice of either single photons or pairs ...

US Pat. 6430345 - Filed Sep 27, 2000 - Deutsche Telekom AG  
6, Di Giuseppe et al., "Entangled non-local **quantum** interfer- ometry," ...  
an interferometer with variable optical **path-length** difference 81p-81S, ...

### Optical layer multicasting using a single sub-carrier header and a multicast ...

US Pat. 6757497 - Filed Jan 30, 2001 - The Regents of the University of California  
Hence, multiple receiving users must all synchronize the **path length** of their  
lasers. ... "Experimental **Quantum Cryptography**", Journal of Cryptology, Vol. ...

### METHOD FOR CHANGING THE POLARIZATION OF AT LEAST ONE OF THE PHOTONS EMITTED ...

US Pat. 6884990 - Filed Feb 21, 2001 - Deutsche Telekom AG  
... for example, in the field of **quantum** computers and **quantum cryptography** to  
... from the pulse-repetition rate and from the optical **path length** from the ...

### Ultra-bright source of polarization-entangled photons



US Pat. 6424665 - Filed Apr 14, 2000 - The Regents of the University of California  
It is worth mentioning that this rate is roughly the minimum requirement for  
**quantum cryptography** in an earth-to- satellite configuration. ...

#### Optical layer multicasting

US Pat. 6873797 - Filed Jan 30, 2001 - The Regents of the University of California  
«32x32 Full-Mesh (1024 **Path**) Wavelength- Routing WDM Network Based on Uniform  
... et al" "Experimental **Quantum Cryptography**," Journal of Cryptology, vol. ...

#### Method for generating a random number on a **quantum-mechanical** basis and ...

US Pat. 6609139 - Filed May 9, 2000 - Deutsche Telekom AG  
Especially well known is the sole secure **cryptography** method in which the key  
... which has undergone careful **quantum-mechanical** investigation is the **path** ...

#### Storage device random bit generator

US Pat. 6317499 - Filed Aug 3, 1998 - Lucent Technologies Inc.  
In **cryptography**, 15 randomness is paramount for key randomness ... Other methods  
include the **quantum-** mechanical noise in transistors and lava lamp blobs. ...

#### **Quantum cryptography** system for a secure transmission of random keys using a ...

US Pat. 6748081 - Filed Jul 20, 1999 - Deutsche Telekom AG  
A feature of conventional **quantum cryptography** methods is the ability to switch  
a polarizer ... To do this, a defined optical **path** must be inserted into two ...

quantum cryptography path length

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fiber optic phase shift path (timing OR synchro

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## Patents

Patents 1 - 50 on fiber optic phase shift path (timing OR synchronization). (0.41 seconds)

### Fiber optic rate sensor

[Sort by relevance](#) | [Sort by date \(new first\)](#) | [Sort by date \(old first\)](#)

US Pat. 4717256 - Filed Jul 21, 1986 - The United States of America as represented by the Secretary of the Navy  
1, the preferred embodiment of a **fiber optic** rate sensor according to the ....  
2 and 3, the non-reciprocal **phase shift** between signals 1 and 2 is time ...

### Fiber optic gyroscopes

US Pat. 4759629 - Filed May 8, 1987 - British Aerospace Public Limited Company

**FIBER OPTIC GYROSCOPES** This invention relates to fibre **optic** gyroscopes. ...

If the coil is rotated about its axis, a non-recipro- 1° cal **phase shift** known ...

### Fiber optic sensor for detecting very small displacements of a surface

US Pat. 4572949 - Filed Dec 14, 1983 - The Board of Trustees of the Leland Stanford Junior University

The geometric **path** is the physical **path** length as opposed to the optical 5 **path**

... cause a **phase shift** of one reflected wavetrain relative to the other. ...

### Fiber optic continuous true time-delay modulator

US Pat. 5526170 - Filed Aug 6, 1993 - The United States of America as represented by the Secretary of the Navy

This method provides 30 a **phase shift** that is independent of frequency. ...

Yet another object of this invention is to use **fiber optic** components to ...

### Fiber optic sensor for detecting very small displacements of a surface

US Pat. 4652744 - Filed Feb 7, 1986 - The Board of Trustees of the Leland Stanford Junior University

The geometric **path** is the physical **path** length as opposed to the optical **path**

which is ... a **phase shift** of one reflected wavetrain relative to the other. ...

### Noise suppression apparatus and method for time division multiplexed fiber ...

US Pat. 5917597 - Filed Feb 4, 1998 - Litton Systems, Inc.

Each **fiber optic** interferometer measures a time varying **phase** delay between ...

According to prior practice, extraction of the **phase shift** is possible by ...

### Fiber optic data distribution for phased array antenna

US Pat. 4583096 - Filed May 23, 1983 - The United States of America as represented by the Secretary of the Air Force

The **fiber** bundle 20 is attached to or built into the radome plate 24 which covers

... to individual modules for controlling **phase shift** in a two-dimensional ...

### Fiber optic acoustic sensor array based on Sagnac interferometer

US Pat. 6097486 - Filed Feb 19, 1999 - The Board of Trustees of the Leland Stanford Junior University

Since the nonlinear **phase shift** is pro- 15 portional to the upper state ...

scheme and exact **timing** of the array is needed for a more accurate calculation. ...

### Repeated, multi-channel fiber optic communication network having fault ...

US Pat. 4451916 - Filed May 12, 1980 - Harris Corporation

controlled oscillator 1261 within the **phase** lock loop 526 of FIG. .... a multistage (5

stages) **shift** register in a feedback **path** to the first stage via gate ...

#### Loop controller for **fiber optic** gyro with distributed data processing

US Pat. 5684589 - Filed Aug 28, 1995 - Litton Systems, Inc.

1 2 LOOP CONTROLLER FOR FIBER OPTIC that introduces an additional **phase shift** through a negative GYRO WITH DISTRIBUTED DATA feedback mechanism to compensate ...

#### Optoelectronic wide bandwidth photonic beamsteering phased array

US Pat. 5051754 - Filed Aug 15, 1990 - Hughes Aircraft Company

For wide instantaneous bandwidth, both the **phase** and the pulse **timing** ...

The transmit/receive module has only three photonic **fiber optic** link cables as ...

#### Fiber optic laser detection and ranging system

US Pat. 6163372 - Filed Feb 9, 1999 - Marconi Aerospace Defense Systems Inc.

10 is a **timing** diagram illustrating the **phase** difference between the local ...

identical **path** as in the pushbroom 25 mode, ie, through the **fiber optic** delay ...

#### Interface configuration for rate sensor apparatus

US Pat. 5157461 - Filed Jun 14, 1990 - Smiths Industries Aerospace & Defense Systems Inc.

Another relative **phase shift** is then induced sensor apparatus 300 can include

... the conductive **path** 310. 25 scope channel, and through the **fiber** ring 304. ...

#### Long feature vertical or horizontal electrical conductor detection ...

US Pat. 5066917 - Filed Jan 17, 1990 - Stolar, Inc.

Electrical noise adds to the **synchronization** signals and causes excessive ...

from a **fiber optic** transmitter such as the PO transmitters 242, 276 or 303. ...

#### Fiber optical gyroscope utilizing orthogonal sequences

US Pat. 5189488 - Filed Nov 25, 1991 - Litton Systems, Inc.

Accordingly, accurate **phase shift** measurement is essential. ... the above-

described **phase** modulation (null **shift**) signal to drive the electro-optic **phase** ...

#### Fiber optic displacement sensor

US Pat. 5808730 - Filed Apr 8, 1997 - CeramOptec Industries Inc.

Here a reflective type of Multichannel **Fiber Optic** Bundle (see FIG. ...

have  $[(n \cdot W + W/4)]$  **phase shift** between them, which creates two basic signals (see FIG. ...

#### Method and apparatus for improving the accuracy of a **phase** shifter

US Pat. 6498544 - Filed Mar 30, 2001 - Precision Microwave, Inc.

1, in a typical long haul **fiber optic** network a head-end system 10 .... 9, if

the **phase shift** modules or elements then as can be seen with a first **path** 202 ...

#### Multiplexed **fiber optic** sensor

US Pat. 4848906 - Filed Feb 2, 1987 - Litton Systems, Inc.

1 is a schematic illustration of a multiplexed **fiber optic** sensor system according

to the invention; FIG. 2 is a **timing** diagram illustrating the method of ...

#### Proper frequency tracker for **fiber optic** sensing coil

US Pat. 5734469 - Filed Mar 13, 1997

25 The rotation rate output of rate **phase shift** detector 36 may go on to a ...

It has been shown in the literature that coil 10 **fiber**, including the **path** of ...

Method for calibrating a downhole receiver used in electromagnetic ...

US Pat. 5260660 - Filed Sep 25, 1992 - Stolar, Inc.

The average value of  $\alpha$  is determined from the set of measured **path** loss ... b.  
causing said **synchronization** signal to be sent over a first **fiber optic** ...

Technique for mitigating rain fading in a satellite communications system ...

US Pat. 4837786 - Filed Aug 7, 1986 - Comstream Corporation

1 thus uses the radio communications **path** from the transmitting antenna 112 to  
... The exemplary frame of data 150 typically includes a **synchronization** ...

Method and apparatus for initialization of a **fiber optic** gyroscope

US Pat. 5999260 - Filed Jul 21, 1998 - Litton Systems, Inc.

The biasing of the **phase shift**, also known as "non-reciprocal null-shift," ...  
**fiber optic** gyro operates on a modulo  $2\pi$  basis in which a **phase shift** of ...

Loop controller for multiplexed triaxial gyro

US Pat. 5337143 - Filed Oct 13, 1992 - Litton Systems, Inc.

The latter effect is employed as the three **fiber optic** gyros to derive angular  
... The biasing of the **phase shift**, SUMMARY also known as "non-reciprocal ...

Self-timed circuit having critical **path timing** detection

US Pat. 5870404 - Filed Aug 8, 1996 - International Business Machines Corporation

1986/**Fiber-Optic** Inverter Repeater. Primary Examiner—Phung M. Chung Attorney ...  
a **timing** detection device for detecting a **timing** margin of a critical **path**, ...

Electrical power line parameter measurement apparatus and systems, including ...

US Pat. 4709339 - Filed May 5, 1986

Alternatively, analog electrical signals from individual circuit **phase** sensor  
modules can be communicated as analog optical signals 40 through **fiber optic** ...

ACTIVELY MODE-LOCKED, SINGLE- POLARIZATION, PICOSECOND OPTICAL **FIBER**  
**LASER**

US Pat. H1926 - Filed Apr 1, 1997

A proportional amplifier mirror 106 coupled to the **fiber** 40 by a coupler 112 having  
... embodiments related modulator 18 after receiving a  $90^\circ$  **phase shift**. ...

**Fiber optic** gyroscope balanced plural serrodyne generators combined signal ...

US Pat. 5018860 - Filed Jan 26, 1989 - Honeywell Inc.

Since the current - the optical **path** and will provide both the bias modula- 15 ...  
there are a number - 30 leads to a **phase shift** of  $2\pi$  radians being provided by ...

Optical network unit implemented with low-cost line interface cards

US Pat. 5600469 - Filed Oct 13, 1995 - NEC Corporation

15 Drop lines 34 are step-index multimode **fiber optic** links. ... The output of  
speed converter 42 is 55 applied to a PSK (**phase shift** keyed) modulator 43 ...

Distributed sensor and method using coherence multiplexing of **fiber-optic** ...

US Pat. 4699513 - Filed May 28, 1985 - Stanford University

The light from the sensors is transmitted via a common **fiber-optic** bus to a ...  
When the modulation amplitude of the **phase** modulator and the **synchronization** ...

Electrical power line parameter measurement apparatus and systems, including ...

US Pat. 4799005 - Filed May 11, 1987

Alternatively, analog electrical signals from individual circuit **phase** sensor modules can be communicated as analog optical signals through **fiber optic** ...

#### Mode-locked active gyro solid state lasers

US Pat. 5363192 - Filed Jun 28, 1991 - Honeywell Inc.

If the opening time of the acousto-**optic** modulator 112 is delayed by 1/12 of ... to be **phase** shifted by a 60 delay line 56 to accomplish a 30° **phase shift**. ...

#### Closed loop **fiber optic** gyro with shupe effect compensation

US Pat. 6181428 - Filed Sep 15, 1999 - LITEF GmbH

The drift bias in the output signal of the **fiber optic** gyro is compensated on the basis of ... a non-reciprocal **phase shift** occurs due to the Sagnac effect. ...

#### Receiver system employing an optical commutator

US Pat. 5325102 - Filed Jun 4, 1993 - Westinghouse Electric Corporation

convent<sup>TM</sup>al fashion. signal is received with an increasing **phase shift** he ^ ^ m ... **Fiber optic** media offer the advan- for a signal received at an antenna ...

#### Optical receiver with an optical coupler and an electronic amplifier

US Pat. 4829598 - Filed Dec 28, 1987 - Siemens Aktiengesellschaft

Optical hybrids for free beam propaga- **Optic** Devices and Technologies tion are ... Since the 90 degree **phase shift** corresponds mixed signal components and a ...

#### Bimorph electro **optic** light modulator

US Pat. 4844577 - Filed Apr 27, 1988 - Sportsoft Systems, Inc.

The physical occlusion of the light **path** by the bimorph interrupts the light beam ... to implement an optical **phase** shifter in **fiber optic** sensor systems. ...

#### Sonet alarm indication signal transmission method and apparatus

US Pat. 5265096 - Filed Jul 3, 1991 - TranSwitch Corporation

**Fiber optic** cable has proved to be a valuable tool of J5 system, ... the location of the SPE in the frame over time constituted an 65 SPE "**phase**" **shift**). ...

#### Transceiver employing direct sequence spread spectrum techniques

US Pat. 4979183 - Filed Mar 23, 1989 - Echelon Systems Corporation

1) code **phase** modulate the carrier by 0° or 180° according ... The currently preferred embodiment of the 55 twisted pair or **fiber optic** cable and thus ...

#### Access subnetwork controller for video dial tone networks

US Pat. 5677905 - Filed Mar 28, 1995 - Bell Atlantic Network Services, Inc.

The Access 5 The signaling **path** 2146 coupled to the components of the late .... local PAC broadcast signal is received by a **fiber optic** (eg signaling). ...

#### Method and apparatus for interferometric rotation sensor **phase** modulation ...

US Pat. 5052808 - Filed Feb 15, 1990 - Litton Systems, Inc.

14c is a graph of the Sagnac **phase** de- **fiber-optic** rotation-sensing ... **phase shift** induced by **phase** information in a rotating **fiber-optic** coil with a the ...

#### Optical gyro, signal processing apparatus for the same and method of driving ...

US Pat. 5048962 - Filed Mar 19, 1990 - Mitsubishi Precision Co., Ltd.

After the **phase** optical **fiber** gyro; **shift** of +fa\ and received at the second ...

applied to a **phase** modulation acousto-optic modulator 4a to be given the ...

#### Optical commutator

US Pat. 5347288 - Filed May 26, 1993 - Westinghouse Electric Corporation

**Fiber optic** media offer the advantage of exceptional BACKGROUND OF THE INVENTION

... **phase shift** is introduced across the atie to an optical source. ...

#### Apparatus for networking computers for multimedia applications

US Pat. 5309564 - Filed Mar 19, 1992

... to cross-connect the user **fiber optic** The plurality of light sources for the

... said transmission system is 15 frequency modulation, **phase shift** keying ...

#### Optical network unit for communicating telephony and video information

US Pat. 6005865 - Filed Nov 26, 1997 - Alcatel USA Sourcing, L.P.

Idle pair wire, and **fiber** optics. ATM cells are automatically inserted when ...

data is filtered original **path** identifier field. by a quaternary **phase shift** ...

#### Universal carrier recovery and data detection for digital communication systems

US Pat. 4866395 - Filed Dec 28, 1988 - GTE Government Systems Corporation

The **phase-error** IF signal on **path** 10 may be any format so long as its constellation

... A symbol tuning **synchronization** circuit data, unless the binary ...

#### Distributed sensor array and method using a pulsed signal source

US Pat. 4770535 - Filed Jun 23, 1986 - The Board of Trustees of the Leland Stanford Junior University

Couplers 112 are positioned at selected locations on a **fiber-optic** return bus

... Likewise, if the **timing** of the pulses from light source 100 is too close ...

#### Electrical power line monitoring systems, including harmonic value ...

US Pat. 4829298 - Filed May 11, 1987

That is, **synchronization** may be effected by using the voltage zero crossings and

inherent **phase shift**  $\omega t = 120^\circ$  for voltage zero crossings of adjacent phases ...

#### Pressure-compensated optical acoustic sensor

US Pat. 5247490 - Filed Jun 4, 1992 - Martin Marietta Corporation

This is accomplished by bus **fiber**. Nevertheless, such an array having a plurality introducing a large amplitude **phase shift** ...

#### Photonic home area network

US Pat. 5983068 - Filed Feb 29, 1996

Similarly, as stated in previous paragraphs **fiber optic path** 200 ...

Frequency-**Shift**-Keying ("FSK"), Quadrature-**Phase-Shift** Keying ("QPSK"), ...

#### Correlator for spread spectrum communications systems

US Pat. 5146471 - Filed Apr 11, 1991 - Echelon Systems Corporation

This modulation method is called **phase shift** keying. .... such as an ordinary

twisted pair or **fiber optic** cable and thus communicate 65 with one another ...

#### Multi spectral imaging ladar

US Pat. 6302355 - Filed Nov 2, 1999 - BAE Systems Integrated Defense Solutions Inc.

13 is a **timing** diagram depicting the **phase shift** between the start ... the identical

**path** as in the pushbroom mode, ie, through the **fiber optic** delay spool ...



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fiber optic phase shift path (timing OR synchr

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fiber optic phase shift path timing probability

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## Patents

Patents 1 - 26 on **fiber optic phase shift path timing probability**. (0.32 seconds)

Optical method for quantum computing [Sort by relevance](#) | [Sort by date \(new first\)](#) | [Sort by date \(old first\)](#)

US Pat. 6678450 - Filed Apr 26, 1999 - The Johns Hopkins University

This produces a **phase shift** if and only if photon 1 is located on the **path** that ... would consist of conventional **fiber-optic** interferom- 60 eters. FIG. ...

Interferometric quantum cryptographic key distribution system

US Pat. 5307410 - Filed May 25, 1993 - International Business Machines Corporation

If the **phase shift** set by the sender and 20 receiver differ by 180°, ... but at the infrared wavelengths most suitable for **fiber optic** communication, ...

Autocompensating quantum cryptographic key distribution system based on ...

US Pat. 6188768 - Filed Mar 31, 1998 - International Business Machines Corporation

In the even (or odd) basis the **phase** modulator imparts a **phase shift** that is an ... 3A illustrates a **fiber-optic** embodiment of the detec- 65 tion stage 16. ...

Technique for mitigating rain fading in a satellite communications system ...

US Pat. 4837786 - Filed Aug 7, 1986 - Comstream Corporation

1 thus uses the radio communications **path** from the transmitting an- 30 tenna ... miles of wire or **fiber** optics, or a series of microwave repeater stations. ...

Long feature vertical or horizontal electrical conductor detection ...

US Pat. 5066917 - Filed Jan 17, 1990 - Stolar, Inc.

Taking a plurality of ampli- uplink **fiber** 38 where it encounters a pair of analog 18 w«h at least one **phase shift** measurement taken at and Sn/b, ...

Method for calibrating a downhole receiver used in electromagnetic ...

US Pat. 5260660 - Filed Sep 25, 1992 - Stolar, Inc.

15 The signal SLO is sent by the downlink **fiber optic fiber** 40 to a mixer 60 ... The geologic medium **phase shift** contribution 60 OM is included in #2- The ...

Demodulators for optical **fiber** interferometers with [3.times.3] outputs

US Pat. 5313266 - Filed Aug 17, 1992

This has the advantage of allowing **optic** coupler into an electrical signal. ... not require expen- signal of interest into optical **phase shift** in the laser ...

High speed self-adjusting clock recovery circuit with frequency detection

US Pat. 5757857 - Filed Mar 13, 1996 - The Regents of the University of California

The **phase** detector of FIG. 3 operates at very nigh speeds and since the **phase** ... See generally Buchwald, "Design of Integrated **Fiber Optic** 20 Receivers ...

Wireless infrared digital audio system

US Pat. 6510182 - Filed Oct 25, 1999 - FreeSystems Pte. Ltd.

Additionally, the communication medium 45 may be a **fiber optic** cable. ...

Chaki modulates a fundamental frequency using Quadrature **Phase Shift** Keying (QPSK) ...



Low shupe bias **fiber optic** rotation sensor coil

US Pat. 5848213 - Filed Jun 30, 1997 - Litton Systems, Inc.

This creates a nonreciprocal **phase shift** that is indistinguishable from the **phase** ... reduces the **probability** of winding defects by providing a **fiber optic** ...

Polarization diversity detector mask selection algorithm

US Pat. 6989903 - Filed Jul 24, 2001 - Northrop Grumman Corporation

55 **Fiber optic** sensor systems acquire in the demodulation process a signal component proportional to the sine of the sensor **phase shift** and another signal ...

Interferometric, self-homodyne optical receiver and method and optical ...

US Pat. 5319438 - Filed Jan 24, 1992 - Board of Regents, The University of Texas System

66 is then used to electrically control the acousto **optic** 2J ... 213-215; and Stark, H., et al., **Probability**, 1MB (e signifies the **fiber** attenuation ...

Wireless infrared digital audio transmitting system

US Pat. 6741659 - Filed Oct 25, 1999 - FreeSystems Pte. Ltd.

Additionally, the communication medium 45 may be a **fiber optic** cable. ... Chaki modulates a fundamental frequency using Quadrature **Phase Shift** Keying (QPSK) ...

Laser communication system and method of operation using multiple ...

US Pat. 6525853 - Filed Sep 15, 1999 - Lucent Technologies Inc.

5A and B are a plot of Binary **Phase Shift** Key (BPSK) modulated laser ... FIG. is a graph in terms of **probability** of the capacity of a multimode **fiber**, ...

Delayed interference wavelength converter and/or 2R regenerator

US Pat. 6832053 - Filed May 31, 2001 - Lucent Technologies Inc.

It is advantageous if there is a **phase-shifter** or/and a gain/absorbing section somewhere in between the interference **path**. 10 Before describing the ...

Method for detecting anomalous geological zones by transmitting ...

US Pat. 5185578 - Filed Jul 19, 1991 - Stolar, Inc.

+e2). where C is the amplitude of S/and<sup>m</sup> is the **phase shift**. ... signal S/<sup>a</sup>is sent through the uplink **fiber** 38 in the signal **path** commencing at the source ...

Resolution in microscopy and microlithography

US Pat. 5952668 - Filed Aug 28, 1997

Lasers 70 and 71 are synchronized by means of a phased locked loop synchronizing circuit 73, which, by means of **phase** detector 74 detects **phase** difference ...

Method and apparatus for improving resolution in scanned optical system

US Pat. 5866911 - Filed Jul 15, 1994

The desired **phase** difference, where the pulse from laser 71 follows the offset of the pulse ... for example by adding a controlled **phase shift** to one of ...

Superresolution in optical microscopy and microlithography

US Pat. 6259104 - Filed Jun 28, 1999

The desired **phase** difference, where the pulse from laser 71 follows the offset of ... for example by adding a controlled **phase shift** to one of the inputs of ...

Wireless infrared digital audio receiving system

US Pat. 6614849 - Filed Oct 25, 1999 - Free Systems Pte. Ltd.

Additionally, the communication medium 45 may be a **fiber optic** cable. ...  
Chaki modulates a fundamental frequency using Quadrature **Phase Shift** Keying (QPSK) ...

Multi-wavelength cross-correlator for ultrashort radiation pulses

US Pat. 6356381 - Filed Dec 18, 1998 - The United States of America as represented by the Secretary of Commerce

The **phase shift** as a function of frequency can be reconstructed by a Fourier ...  
of femtosecond pulses in the near-field of an optical **fiber** tip 816. ...

Superresolution in microlithography and fluorescence microscopy

US Pat. 6903347 - Filed Jul 9, 2001

The desired **phase** difference, where the pulse from laser 71 55 follows the offset  
... for example by adding a controlled **phase shift** to one of the inputs of ...

Avalanche photodiodes with an impact-ionization-engineered multiplication region

US Pat. 7045833 - Filed Oct 1, 2001 - Board of Regents, The University of Texas System

17 may also increase the carriers' recombination **probability** thereby reducing  
... photo- detectors and imposes limitations for **fiber optic** communications. ...

Integrated triad optical rate sensor apparatus

US Pat. 4828389 - Filed Apr 21, 1987 - Smiths Industries

The greater inertial input rate) and the non-reciprocal **phase shift** the input  
... portion of the when the light wave signal emerging from the **fiber** ring ...

Method and apparatus for microlithography

US Pat. 5777342 - Filed Dec 29, 1995

The desired **phase** difference, where the pulse from laser 71 follows the offset of  
... for example by adding a controlled **phase shift** to one of the inputs of ...

Method and apparatus for the deception of satellite navigation

US Pat. 6396432 - Filed Jun 15, 1999 - C. Plath GmbH, Nautisch-Elektronische Technik

Conceivable methods include ,fl descent is induced and the **probability** of a ground  
collision signal, coaxial lines, **fiber-optic** guides, radio relay links or ...

fiber optic phase shift path timing probability

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optic phase modulation path

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## Patents

Patents 1 - 50 on **optic phase modulation path**. (0.13 seconds)

Method for damping optical fiber on a bias optical **phase** modulator    [Sort by relevance](#) | [Sort by date \(new first\)](#) | [Sort by date \(old first\)](#)

US Pat. 5559908 - Filed Jun 6, 1995 - Honeywell Inc.

Such **path** length differences between the waves introduce a **phase** shift between ... the output current of the photodetector without optical **phase modulation**. ...

Stress-optical **phase** modulator and **modulation** system and method of use

US Pat. 5383048 - Filed Feb 3, 1993

The stress-**optic phase modulation** system of the pres- Yet, ... the optical **path** length of one or more optical beams tivity of waves of photons with each ...

Optical **phase modulation** instruments

US Pat. 4289403 - Filed Mar 4, 1977 - Isco, Inc.

The **phase** modulated light beams are applied to an optical **path** length sensor to ... a fluid to be monitored so that a comparison of the **modulation** of the 45 ...

Synchronous polarization and **phase modulation** for improved performance of ...

US Pat. 5912755 - Filed Feb 8, 1996 - Tyco Submarine Systems Ltd.

The excess **phase modulation** is given by the average of the two angles ...

The transmission **path**, which used circulating loop techniques, extended 6300 kms ...

Synchronous polarization and **phase modulation** for improved performance of ...

US Pat. 6057950 - Filed Feb 9, 1999 - Tyco Submarine Systems, Ltd.

2 or 3, transmission medium 404, and telemetry **path** 406 which connects ...

The excess **phase modulation** is given by the average of the two angles  $(\S_i + \S^A)/2$ . ...

**Phase** modulator for semiconductor waveguide

US Pat. 6298177 - Filed Mar 23, 2000 - Bookham Technology PLC

BACKGROUND OF THE INVENTION Optical **phase** modulators may be used in ... extending along the **path** of the rib for the length of a **phase modulation** region, ...

Harmonic **phase modulation** error reducer

US Pat. 5457532 - Filed May 31, 1994 - Honeywell Inc.

Fiber **optic** gyroscopes are an attractive means with which to sense rotation of an ... Such **path** length differences between the waves introduce a **phase** shift ...

Fiber optical discrete **phase modulation** system

US Pat. 4725844 - Filed May 1, 1987 - TRW Inc.

One common method of **phase modulation** is quadrature **phase-shift** keying (QPSK)

... When a 90-degree **phase** delay is called for, an optical **path** is switched in ...

Polarization independent optical **phase** modulator

US Pat. 5973817 - Filed May 8, 1998 - Sharp Kabushiki Kaisha

The optical **path** through each pixel is folded by reflection at the mirror 15 ...  
and the electrode 15 have **optic** axes aligned at angles of -9 and +9, ...

Synchronous polarization and **phase modulation** for improved performance of ...

US Pat. 5526162 - Filed Sep 27, 1994 - AT&T Corp.

along the transmission **path**, contribute to signal fading and SNR fluctuations.  
... the **phase** of the polarization **modulation** imparted to the optical signal ...

Optical gyro, signal processing apparatus for the same and method of driving ...

US Pat. 5048962 - Filed Mar 19, 1990 - Mitsubishi Precision Co., Ltd.

Field of the Invention for- On the other hand, the **phase modulation** is preferred ...  
... which includes a **phase** modulator and a pair of acousto-**optic** modulators ...

Method and device for stable and controllable optical **phase modulation**

US Pat. 4776678 - Filed Oct 17, 1985 - Centre National de la Recherche Scientifique

A second halfwave plate is disposed on the **path** of two of the four ... 25 In yet  
another embodiment, the **phase modulation** device comprises a masking device ...

Optical gyro with expanded detectable range of input rotation angular ...

US Pat. 5412471 - Filed Feb 25, 1992 - Mitsubishi Precision Co., Ltd.

ISA and 18B. **path**, an optical **path** difference is obtained between the ...  
a constituent- each embodiment of the present invention; **modulation**. the main parts ...

Optical system and method for changing the lengths of optical paths and the ...

US Pat. 6233070 - Filed Aug 20, 1998 - Bookham Technology PLC

If light beams are transmitted along the two selected optical paths and the length  
of each optical **path** is varied, the **phase** of each light beam will be ...

Cancellation of distortion components in a fiber **optic** link with feed ...

US Pat. 5699179 - Filed Feb 23, 1996 - General Instrument Corporation of Delaware

The apparatus of claim 2, wherein said **phase** OMI k is adjusted based on the ...  
power signal in said first **path** according to a **phase** optical **modulation** ...

**Phase** modulator for fiber-**optic** sensors

US Pat. 4703287 - Filed Aug 22, 1985 - United Technologies Corporation

60 In many Fiber-**Optic** Gyroscopes disclosed in the technical literature, **phase**  
**modulation** is accomplished by wrapping one or more loops of the optical fiber ...

Interferometric fiber **optic** displacement sensor

US Pat. 5891747 - Filed May 30, 1995

The **path** length difference in an interferometer is set very close to zero in high  
... For this reason, **phase modulation** in the integrated **optic** arm 2 of an ...

Resonant **phase** modulator

US Pat. 4998255 - Filed Oct 11, 1989 - Lightwave Electronics Corporation

The single frequency light beam passes along the input **path** 53 until it ...  
crystal 21 used for **phase modulation** or amplitude **modulation** purposes. FIG. ...

Dynamic optical **phase** state detector

US Pat. 6147755 - Filed Apr 1, 1999 - TRW Inc.

In the straight **phase** modulator, the light enters an electro-**optic** medium that has  
... representative of the RF **modulation** frequency and having a **phase** that ...

Optical modulator for producing a controllable chirp

US Pat. 5408544 - Filed Jun 29, 1994 - Fujitsu Limited

On optical **phase** modulator 46 after the **modulation** in the gether with the portion ... 48x 44. corresponding to the upstream side of the optical **path** Next, ...

Fiber **optic** rate sensor

US Pat. 4717256 - Filed Jul 21, 1986 - The United States of America as represented by the Secretary of the Navy  
1, the preferred embodiment of a fiber **optic** rate sensor according to the present  
.... plus the change in **path** length(t) due to the **modulation** by the **phase** ...

Interferometric fiber **optic** displacement sensor

US Pat. 5420688 - Filed Dec 14, 1992

of an interferometer 3 necessitates use of fiber-**optic** made without ... cal **path**,  
wherein the direction of said radiant en- for **phase modulation** in general. ...

Optical **phase** detector

US Pat. 6891149 - Filed Sep 22, 1999 - Qinetiq Limited

The optical **phase** 20 detector in FIGS. 4 and 5 may also include a second  
electro-**optic phase** modulator in the **path** of the input signal 4. ...

Digital **phase** modulator for fiber **optic** sagnac interferometer

US Pat. 5137359 - Filed Mar 18, 1991 - Litton Systems, Inc.

Description of the Prior Art In addition to **phase modulation**, the processing of  
the The ... along a single optical nitely due to voltage constraints. **path**. ...

Fiber **optic** gyroscope **modulation** error reduction

US Pat. 5289258 - Filed Jan 15, 1992 - Honeywell Inc.

Thus, the bias **modulation** system induced time varying **phase** change experienced  
by the electromagnetic waves passing 20 along the optical **path** of the **phase** ...

System and method for simultaneously compensating for chromatic dispersion ...

US Pat. 5539563 - Filed May 31, 1994 - AT&T Corp.

Thus, future fiber-**optic** systems will likely be capable of operating at data ...  
in which chromatic dispersion and self **phase modulation** are compensated ...

Fiber **optic** gyro stabilized by harmonic components of detected signal

US Pat. 4883358 - Filed Aug 25, 1988 - Japan Aviation Electronics Industry Limited

A fiber **optic** gyro comprising: a circular optical **path** of at least one loop; ...

The fiber **optic** gyro of claim 7, including third **phase modulation** control ...

Integrated triad optical rate sensor apparatus

US Pat. 4828389 - Filed Apr 21, 1987 - Smiths Industries

The time multiplexed 5 portion of the signal DS on conductive **path** 358 is ...

After **phase modulation**, the CW wave signal 374 and CCW wave signal 376 are ...

Optical modulator for CATV systems

US Pat. 5787211 - Filed Apr 3, 1996 - General Instrument Corporation of Delaware

An external electro-**optic phase** modulator for pre- chirping said ... An integrated  
electro-**optic** device including said intensity **modulation** apparatus of ...

Terahertz repetition rate optical computing systems, and communication ...

US Pat. 5150248 - Filed Jul 21, 1989

... system using the temporal effects of cross-**phase modulation** comprising: 5 ...  
by cross-**phase modulation**; .. e) filter means disposed along the **path** of ...

Sub-tau **phase modulation** in a fiber-optic rotation sensor

US Pat. 4948252 - Filed May 24, 1989 - Litton Systems, Inc.

When the **phase** difference is close to zero, the the closed light **path** of the ...  
artificially an One method of **phase modulation** used hi closed-loop methods, ...

Fiber optic angular rate sensor including digital **phase modulation**

US Pat. 5400142 - Filed May 3, 1994 - AlliedSignal Inc.

In a fiber **optic** angular rate sensor of the type on the **phase** of the light waves.  
... Pockels elec- terclockwise traveling light, a **phase modulation** ar- ...

Terahertz repetition rate optical computing systems, and communication ...

US Pat. 5463485 - Filed Jun 15, 1994

... a non-linear material disposed along the **path** of said third beam for ...  
caused by cross-**phase modulation**, filter means disposed along the **path** of said ...

All optical logic using cross-**phase modulation** amplifiers and mach-zehnder ...

US Pat. 6522462 - Filed Aug 14, 2001 - Super Light Wave Corp.

The lower-**path phase** shift is 0, so \$2 is 0. FIGS. 4A-C show an optical interferometer  
OR-NOR From FIG. 2B, when the inputs to MMI combiner 24 are gate with ...

Fiber **optic** electric field sensor/**phase** modulator

US Pat. 4477723 - Filed Nov 4, 1981 - Optical Technologies, Inc.

Measurements of optical fiber **modulation** are frequently accomplished with ...  
the optical **phase** shift of one beam or optical **path** with respect to the other. ...

Synchronous amplitude **modulation** for improved performance of optical ...

US Pat. 6556326 - Filed Jan 17, 2001 - Tyco Telecommunications (US) Inc.

1 or 4, transmission medium 602, and telemetry **path** 603 which connects equipment at  
... said optical **phase** modulator providing optical **phase modulation** to ...

Optical communication system with **phase modulation**

US Pat. 6545785 - Filed Apr 1, 1999 - TRW Inc.

This linearly changing optical **path** length causes a linearly 65 changing state  
of optical **phase** corresponding with a linearly changing analog **modulation** ...

Optical waveguide vibration sensor and method

US Pat. 5497233 - Filed Jul 27, 1994 - Litton Systems, Inc.

The increased **phase** 5 shift arises because optical signals in one optical ...  
which causes **phase modulation** of optical signals 65 guided by the leg of the ...

Fiber **optic** earth rotation gyro compass

US Pat. 4712306 - Filed Dec 27, 1985 - McDonnell Douglas Corporation

A fiber **optic** gyro, comprising: (a) a light source means for producing a first  
... a harmonic 50 **modulation** to the second beam of light; (e) a second **phase** ...

Configuration control of mode coupling errors

US Pat. 5377283 - Filed Apr 16, 1993 - Honeywell Inc.

In the presence of **modulation** provided by **phase** modulator 19, ... waves passing  
through coil 10 are all intended to take the same optical **path**. ...

Ultra-high capacity non-soliton optical transmission using optical **phase** ...

US Pat. 5365362 - Filed Sep 10, 1993 - AT&T Bell Laboratories

... **optic** transmission **path** allows the first order chro- phenomenon is known as self-**phase modulation** in sin- matic distortion of the first half of the **path** ...

Fiber **optic** gyroscope output noise reducer

US Pat. 5469257 - Filed Nov 24, 1993 - Honeywell Inc.

In the presence of **modulation** provided by **phase** modulator 19, ... waves passing through coil 10 50 are all intended to take the same optical **path**. ...

Optical telecommunications system employing multiple **phase**-compensated ...

US Pat. 5459600 - Filed Mar 8, 1994 - Optimux Systems Corporation

The preferred embodiment is the integrated electro-**optic phase** modulator formed on ... upon the **phase modulation** introduced by **phase** modulators 26F and 26S, ...

Piezoelectric optical switch device

US Pat. 6453086 - Filed Mar 6, 2000 - Corning Incorporated

This circular symmetric in-line offset from the first propagation **path** such that only a fiber **phase** modulator provides **phase modulation** in a fre- ...

Fiber **optic** rotation sensor with extended dynamic range

US Pat. 4687330 - Filed Apr 25, 1983 - The Board of Trustees of the Leland Stanford Junior University

10 to said first frequency driving signal. first **phase** modulator means for ... the amplitude of said **phase modulation** at therein which are **phase** modulated ...

Fiber **optic** detection system using a Sagnac interferometer

US Pat. 5046848 - Filed Sep 8, 1989 - McDonnell Douglas Corporation

The fiber **optic** sensor of claim 18 wherein said **phase modulation** means further ... along and near one end of said fiber **optic path**; **phase modulation** means, ...

Optical power balancing in interferometric fiber **optic** gyroscopes

US Pat. 5563705 - Filed Jun 7, 1995 - Honeywell, Inc.

This **modulation** providing 180 degrees of **phase** difference between the two waves ... **phase** modulator, or frequency shifter, near the coil in an optical **path** ...

Multiplexed optical communication system

US Pat. 4866698 - Filed Nov 17, 1987 - The Boeing Company

2, comprising 30 conditions, **modulation** of the optical **path** length of the ... with the **phase modulation** technique of source wavelength is not required, ...

Thermal **phase** modulator and method of **modulation** of light beams by optical means

US Pat. 5166988 - Filed Oct 31, 1991 - The United States of America as represented by the Secretary of the Navy

This change in optical **path** length shifts the **phase** of the light beam passing through the waveguide, which shift can be measured by measuring the resulting ...

Optical digital regenerator

US Pat. 6532091 - Filed Feb 8, 1999 - KDD Corporation

The difference of the optical **path** lengths of the 20 two optical paths ... To cope with the problem, using **phase modulation** together can shorten the length ...



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optic phase modulation path

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